



**NATIONAL WILDLIFE FEDERATION®**  
GREAT LAKES NATURAL RESOURCE CENTER®  
*People and Nature: Our Future Is in the Balance*

**Before a Joint Session of the Senate Natural Resources and Environment and  
House Natural Resource, Great Lakes, Land Use and Environment  
Committees**

**Testimony of Andy Buchsbaum On S.B. 332  
Director, Great Lakes Natural Resource Center, National Wildlife Federation**

April 14, 2005

Chairman Birkholz, Chairman Palsrok, members of the Senate and House Committees, thank you for the opportunity to testify before you today on this critical issue for the Great Lakes. I am Andy Buchsbaum, director of the Great Lakes office of the National Wildlife Federation located in Ann Arbor, Michigan. For those of you who don't know me, think of me as an older and grayer version of my NWF colleague, Noah Hall. As I'm sure you know, the National Wildlife Federation has a strong and historic commitment to the Great Lakes and to Michigan. We have 120,000 members and supporters in Michigan. NWF also is proud to have as its state affiliate the nation's largest state conservation organization, the Michigan United Conservation Clubs.

NWF strongly supports the legislation under consideration in this hearing designed to stop the introduction of invasive species from ballast water discharges from ocean-going vessels. Passage of this legislation is critically important to protect and restore the Great Lakes and their recreational, economic, and ecological importance to Michigan. Most scientists now agree that the worst problem facing the Great Lakes today is the introduction of aquatic invasive species. To date, more than 160 non-native species have invaded the Great Lakes, and a new aquatic invader enters the Great Lakes on average *every eight months*.

Non-native aquatic species in the Great Lakes disrupt an ecological balance that has taken thousands of years to establish. They are threatening the health of fish and other wildlife. They are threatening a \$4.5 billion world-class fishing industry. They are threatening a way of life for millions of citizens who fish and recreate on the Great Lakes.

As new species are introduced and establish themselves—out-competing native species for food and habitat—they change the environment physically, biologically and chemically. These changes are generally harmful to the behavior, growth and reproduction of native species as well as the way they interact with each other in the aquatic food web.

We are already seeing the results, and they are devastating: the foundation of the Great Lakes food web is collapsing.

Fully 99 percent of the foundation of the food web – the food available to fish in the sediments of the Great Lakes – is made up of four species: tiny shrimp-like creatures called *Diporeia*; fingernail clams; certain worms, and opossum shrimp. Of these, *Diporeia*, the tiny shrimp, dominate, themselves making up 80 percent of the available food.

But since about 1990, the *Diporeia* and fingernail clam populations have crashed over vast stretches of Lake Michigan and other lakes. *Diporeia* populations have gone from 10,000 organisms per square meter to virtually zero in many areas. The chart I have with me today tracks the collapse of *Diporeia* populations in Lake Michigan; Lakes Huron and Ontario have seen similar declines.

Scientists believe that the cause of this collapse is zebra mussels, although they are still searching for the mechanism that causes the disappearance of the *Diporeia*. Scientists have also seen a parallel crash in the populations of fingernail clams, and are now concerned about the viability of the other major food source, the opossum shrimp. Another invasive mussel, the quagga mussel, is rapidly colonizing the deeper waters of the lakes where the opossum shrimp lives, and its population is now at risk.

The damage to these foundation species is sending tidal waves throughout the Great Lakes food web. We are seeing impacts on perch, walleye, and trout. Combined with the other invasive species that have invaded our region, the Great Lakes are experiencing ecosystem shock. As invasive species like zebra mussels overwhelm the Great Lakes, large stretches of the lakes have become underwater deserts.

These rapid and dramatic changes to the Great Lakes food web are unprecedented in the recorded history of the lakes. And unless we take action now, the attacks on the lakes will only worsen. The damage to the food web done by zebra mussels, quagga mussels, and other aquatic invaders will be very difficult to repair; it is one of the top priorities in restoring the Great Lakes.

But unless we stop new invaders from entering the lakes, that restoration will be impossible. The Great Lakes cannot even begin to recover when every eight months another invasive species enters the lakes and begins to wreak its own particular kind of havoc on the ecosystem. Scientists say they are falling farther and farther behind in even understanding the lakes because the system changes so dramatically due to these fresh invasions.

Ultimately, the federal governments of the U.S. and Canada must join together to stop the invasion of exotic nuisance species into the Great Lakes. Despite some champions in Congress, however, thus far federal action has been too little, too late.

For that reason, NWF strongly supports the enactment of a state law like the one being considered today by your Committees. S.B. 332 would enable the state to put into place protections against the most common route of invasion: the discharge of ballast water from ocean-going ships. Currently, there is no federal requirement that such ships treat their ballast water, and most vessels do not even exchange it with cleaner water before entering the Great Lakes. Today's proposed law would direct the state to develop a protective standard in conjunction with other states, and also clarify the authority of the state to enforce that standard.

Momentum is building to protect and restore the Great Lakes. The Great Lakes Regional Collaborative, established through President Bush's Executive Order last year, is developing a comprehensive restoration plan. The President's budget for the first time proposes to fully fund the Great Lakes Legacy Act, which will help clean up contaminated sediments. A broad coalition of Great Lakes citizens, organizations and scientists is coming together to advocate for these measures.

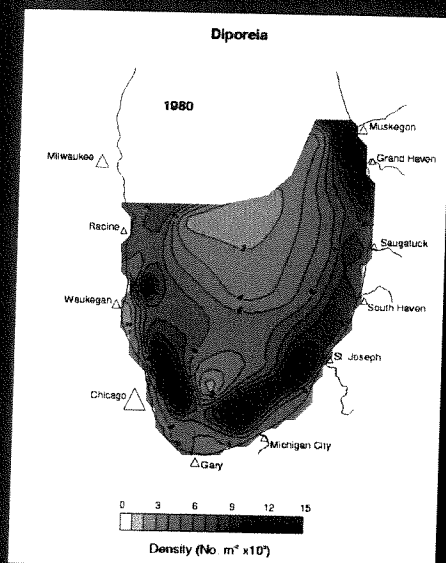
Today's proposed Michigan law fills a critical gap in those efforts, and will enable us to protect the Great Lakes from the continued assault from invasive species.

*Changes in abundance of *Diporeia* in sediments of southern Lake Michigan from 1980 – 2000. By 1998, large sections of nearshore waters in the southern and southeastern portion of the lake were supporting few if any numbers of the shrimp-like organism. (Graphic from T. Nalepa, Great Lakes Environmental Research Laboratory, NOAA)*

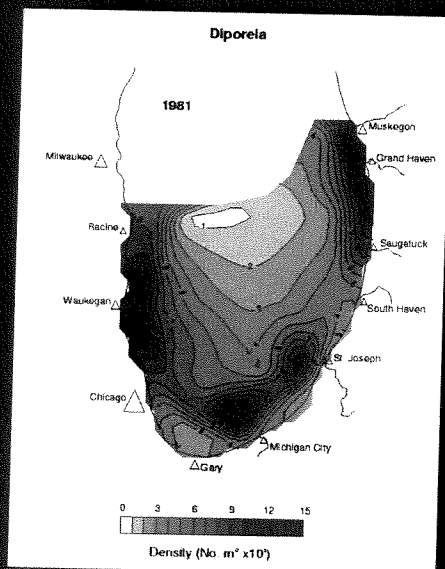
## *Diporeia* in Lake Michigan: Examples of Declines in these Lakebed Food Resources

*Diporeia* numbers in southern Lake Michigan dropped slightly during the 1980's, but decreased much more rapidly beginning in the early 1990's following the introduction of zebra mussels to the lake in 1989.<sup>89</sup>

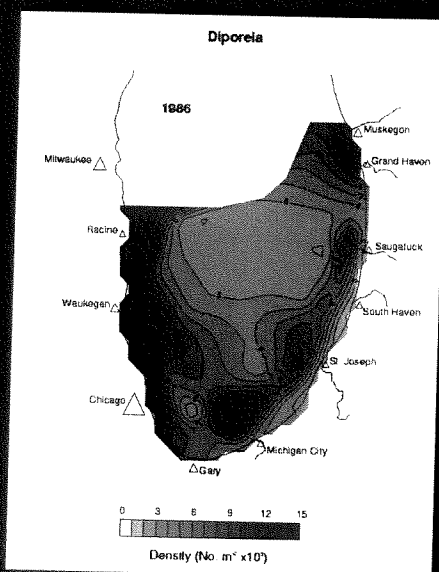
- The density of *Diporeia* at the Grand Haven, MI station dropped from 10,000 per square meter in the 1980s and early 1990s to 110 per square meter in 1999 after zebra mussels were discovered in the area in 1992 – a 99 percent decline.
- The mean density of *Diporeia* off Muskegon, MI declined from 5,569 per square meter to 1,422 per square meter.
- By 1998, *Diporeia* declined in southern Lake Michigan and were rare or absent off Grand Haven, Saugatuck, South Haven, and St. Joseph out to depths of 70 meters.<sup>90</sup>



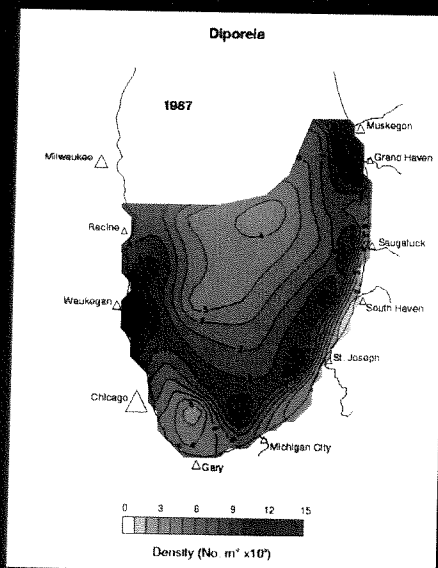
1980



1981



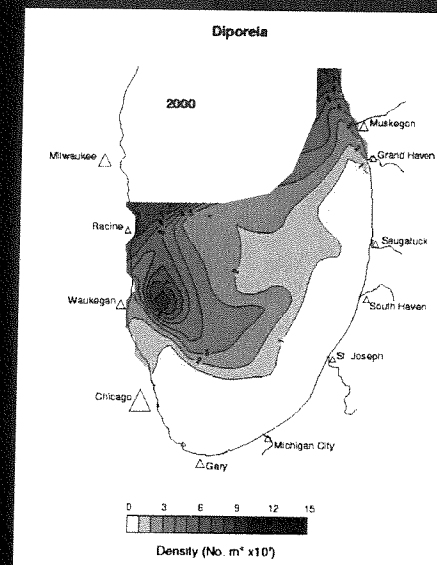
1986



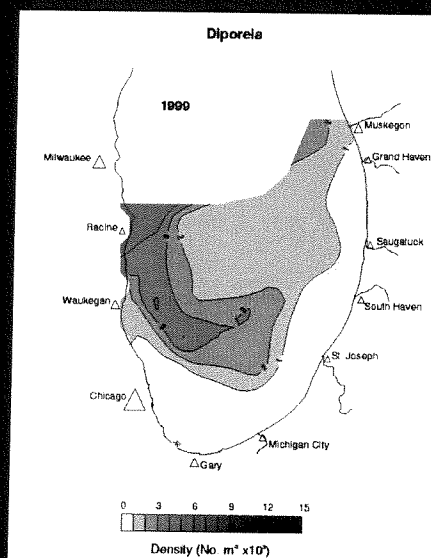
1987

Similar changes in *Diporeia* populations have been observed in sampling of a number of sites in Lake Ontario:

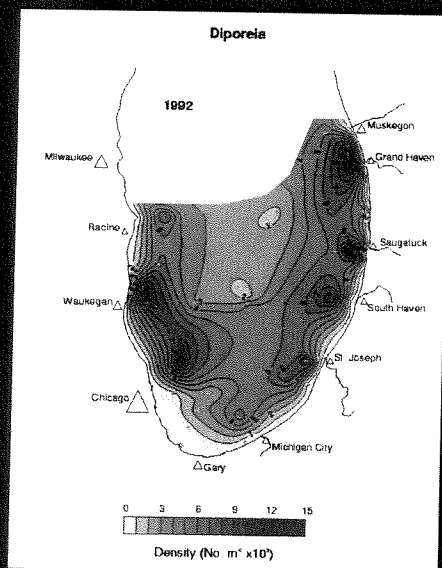
- Mean densities of *Diporeia* were at least 130 times greater in 1964 and 1972 than in 1997 after zebra mussel establishment.
- At locations where *Diporeia* was abundant, densities dropped to 15% of their former levels in three years (averaged 6,363 per square meter in 1994 and only 954 per square meter in 1997).
- The percentage of stations where no or very few *Diporeia* were found more than doubled from 40% in 1994 to 84% in 1997.
- A zone of very low *Diporeia* density ( $< 4$  individuals per square meter) extends as far as 16 miles (26 kilometers) offshore and to depths of 656 feet (200 meters) over 40% of the total surface area of Lake Ontario soft sediments in 1997.



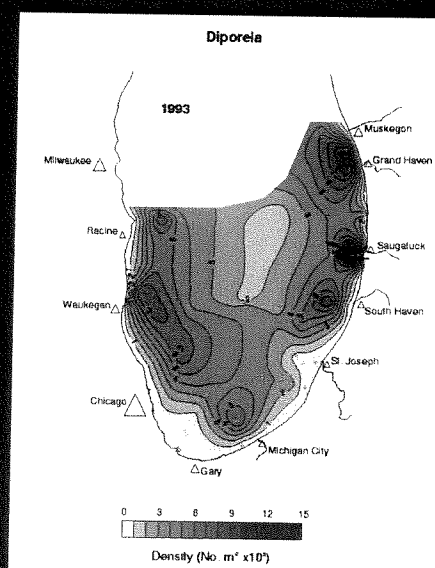
2000



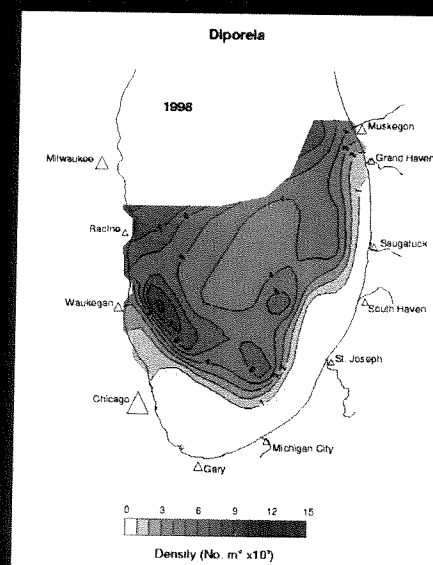
1999



1992



1993



1998